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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,571	01/19/2002	Johan Engstrom	47862.256153	1747

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EXAMINER	
HOLMES, MICHAEL B	
ART UNIT	**PAPER NUMBER**
2121	

DATE MAILED: 06/25/2004 10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/683,571	ENGSTROM ET AL.
	Examiner	Art Unit
	Michael B. Holmes	2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-72* is/are pending in the application.

4a) Of the above claim(s) *1-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21,48,67 and 69* is/are rejected.

7)☒ Claim(s) *22-47,49-66,68 and 70-72* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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Examiner's Detailed Office Action

Response to Amendment

1. This Office Action is responsive to communication received on **April 1, 2004.** Amendment "A" under 37 CFR § 1.111. Reconsideration and allowance of the present application **09/683,571**, filed **January 19, 2002**, is respectfully requested by applicant. All such supporting documentation has been placed in applicant's file.

2. **Claims 1-20 have been canceled**

3. **Claims 21-72 have been added.**

4. Applicant's amendment necessitated the new ground(s) of rejection. Moreover, a new prior art search was required.

Claim Objection(s)

5. Claims 22-47, 49-66, 68, & 70-72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> **(b) the invention was patented** or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claim 21** is rejected under **35 U.S.C. 102(b)** as being anticipated by **Nasburg (USPN 5,801,943).**

Regarding claim 21:

Nasburg teaches,

A method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic; **[(col. 14, line 46 to col. 15, line 23 "***Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor****. Video sensors provide very good finger-printing information due to the wide diversity of* <u>*vehicle*</u> *shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway*

areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for <u>vehicle</u> detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for ***Real-Time Image Processing at TV Rates****, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular <u>vehicle's</u> fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the <u>vehicle's</u> attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to <u>Statistical Pattern Recognition</u>; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include <u>vehicle</u> image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the <u>vehicle's</u> image.*")]**

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven. **[(col. 8, line 4-13 "***The micromodel provides the traffic engineer with an intuitive and efficient method for describing or modeling complex traffic*

intersections and interchanges so that the kinematic behavior of all vehicles within that interchange can be predicted. Parameters provided as inputs by the traffic engineer are mapped directly to a set of differential equations governing the movement through time of all vehicles within the interchange. The result is a compact dynamic model usable in vehicle tracking applications and in graphic simulations, including real time simulations, of vehicles as they proceed through the interchange.")]

Regarding claim 48:

Nashburg teaches,

A method for ascertaining on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of

(i) a non-GPS based, geographically unspecific vehicle characteristic **[Abstract ("***A wide area surveillance system for application to large road networks is described. The system employs smart sensors to identify plural individual vehicles in the network. These vehicles are tracked on an individual basis, and the system derives the behavior of the* <u>*vehicle*</u>*. Furthermore, the system derives traffic behavior on a local basis, across roadway links, and in sections of the network. Processing in the system is divided into multiple processing layers, with geographical separation of tasks.*")] and

(ii) a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis; **[(col. 14, line 46 to col. 15,**

line 23 "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor.*** *Video sensors provide very good fingerprinting information due to the wide diversity of* *vehicle* *shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for* *vehicle* *detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular* *vehicle's* *fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the* *vehicle's* *attributes. Several*

such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to Statistical Pattern Recognition; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include vehicle image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the vehicle's image.")**]**

performing statistical pattern recognition analysis on the data set; **[(col. 14, line 46 to col. 15, line 23** "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor.*** *Video sensors provide very good fingerprinting information due to the wide diversity of vehicle shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for vehicle detection. Automated image processing is described in R. Haralick and L. Shapiro,*

Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular vehicle's fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the vehicle's attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to Statistical Pattern Recognition; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include vehicle image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the vehicle's image.")] and ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis. **[(col. 14, line 46 to col. 15, line 23** "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor****. Video sensors provide very good fingerprinting information due to the wide diversity of vehicle shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software*

removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for <u>*vehicle*</u> *detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular* <u>*vehicle's*</u> *fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the* <u>*vehicle's*</u> *attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to* <u>*Statistical Pattern Recognition*</u>*; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include* <u>*vehicle*</u> *image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the* <u>*vehicle's*</u> *image.*")]

Regarding claim 67:

Nashburg teaches,

A method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, a vehicle characteristic and collecting therefrom a data set for statistical pattern recognition analysis; **[(col. 6, line 21-32** "*The illustrated system of the present invention can provide dynamic wide area measurements of traffic flow for real-time proactive traffic control. The illustrated system of the present invention can provide effective wide area traffic surveillance through an integrated picture of the entire road network, showing such information as areas where heavy traffic flow will soon cause congestion, whether high occupancy* <u>*vehicle*</u> *(HOV) lanes are functioning properly, where on-ramp metering or signal light timing needs adjustment to lessen congestion, and which alternative routes could be suggested to motorists and the news media to reduce their travel times.*"**)]**

performing statistical pattern recognition analysis on the data set; **[(col. 14, line 46 to col. 15, line 23** "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor****. Video sensors provide very good fingerprinting information due to the wide diversity of* <u>*vehicle*</u> *shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information*

available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for vehicle *detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular* vehicle's *fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the* vehicle's *attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to* Statistical Pattern Recognition*; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include* vehicle *image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the* vehicle's *image.*")] and

ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis. **[(col. 14, line 46 to col. 15, line 23** "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor****. Video sensors provide very good fingerprinting information due to the wide diversity of vehicle shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for vehicle detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular vehicle's fingerprint. The extracted attributes thus represent the fingerprint. Approaches from*

image processing and pattern recognition can be used for generation of the vehicle's attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to Statistical Pattern Recognition; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include vehicle image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the vehicle's image.")]

Regarding claim 69:

Nashburg teaches,

A method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis; **[(col. 6, line 21-32** "*The illustrated system of the present invention can provide dynamic wide area measurements of traffic flow for real-time proactive traffic control. The illustrated system of the present invention can provide effective wide area traffic surveillance through an integrated picture of the entire road network, showing such information as areas where heavy traffic flow will soon cause congestion, whether high occupancy vehicle (HOV) lanes are functioning properly, where on-ramp metering or signal light timing needs adjustment*

to lessen congestion, and which alternative routes could be suggested to motorists and the news media to reduce their travel times.")]

performing statistical pattern recognition analysis on the data set; **[(col. 14, line 46 to col. 15, line 23** "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor.*** *Video sensors provide very good fingerprinting information due to the wide diversity of vehicle shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be, for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for vehicle detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is*

then analyzed to develop a set of features or attributes that quantify a particular vehicle's fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the vehicle's attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to Statistical Pattern Recognition; 1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include vehicle image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the vehicle's image.")**]** and ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis. **[(col. 14, line 46 to col. 15, line 23** "*Each of the sensor types listed have advantages and disadvantages.* ***For example, video sensors can be used by the system and also for real-time surveillance by a human operator, hence reducing system cost by getting double duty from a sensor.*** *Video sensors provide very good fingerprinting information due to the wide diversity of vehicle shapes and colors. A disadvantage of video sensors are their inability to operate in heavy fog. Radar sensors can operate in fog but are costly and do not provide the quality of fingerprinting information available in a video data stream. To illustrate the functionality of an SSI, an example using a video camera is given. In this case, the SSI's software removes uninteresting areas of the scene (non-roadway areas) as defined during setup of the SSI. Video FOV's tend to include both roadway and non-roadway areas. By eliminating the non-roadway areas from further processing, SSI hardware requirements are reduced. The SSI scans the roadway part of the video sensor's image to detect vehicles. The video sampling rate may be,*

for example, one frame per second. Preferably, the video sampling rate is variable and is based upon the particular conditions of the network. Several approaches common to image processing can be used for vehicle *detection. Automated image processing is described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 2, 3, and 4 and W. Pratt, Digital Image Processing; 1991; Wiley; New York, N.Y.; Section 18.1 and N. L. Seed and A. D. Houghton, Background Updating for Real-Time Image Processing at TV Rates, 1988 which are incorporated herein by reference. The imagery associated with detected vehicles is then analyzed to develop a set of features or attributes that quantify a particular* vehicle's *fingerprint. The extracted attributes thus represent the fingerprint. Approaches from image processing and pattern recognition can be used for generation of the* vehicle's *attributes. Several such approaches are described in R. Haralick and L. Shapiro, Computer and Robot Vision; 1992; Addison-Wesley; Reading, Mass.; Chapter 9 and 10 and K. Fukunaga, Introduction to* Statistical Pattern Recognition; *1972; Academic Press; New York, N.Y. which are incorporated herein by reference. For a video camera, typical attributes could include* vehicle *image size, average grey level, normalized red, green and blue average values, shape moments, and grey level spread between maximum and minimum grey level values of the* vehicle's *image.*")]

Examiners Summary

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

9. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence Information

10. Any inquiries concerning this communication or earlier communications from the examiner should be directed to **Michael B. Holmes** who may be reached via telephone at **(703) 308-6280**. The examiner can normally be reached Monday through Friday between 8:00 a.m. and 5:00 p.m. eastern standard time.

If you need to send the Examiner, a facsimile transmission regarding After Final issues, please send it to **(703) 746-7238**. If you need to send an Official facsimile transmission, please send it to **(703) 746-7239**. If you would like to send a Non-Official (draft)

facsimile transmission the fax is **(703) 746-7240**. If attempts to reach the examiner by telephone are unsuccessful, the **Examiner's Supervisor, Anthony Knight**, may be reached at **(703) 308-3179**.

Any response to this office action should be mailed too:

Director of Patents and Trademarks Washington, D.C. 20231. Hand-delivered responses should be delivered to the Receptionist, located on the fourth floor of **Crystal Park II, 2121 Crystal Drive Arlington, Virginia.**

Michael B. Holmes
Patent Examiner
Artificial Intelligence
Art Unit 2121
United States Department of Commerce
Patent & Trademark Office

Anthony Knight
Supervisory Patent Examiner
Group 3600